Pattern Recognition Receptor Lectures 2015 - Dr Tom Monie

The lecture slides are available on the Moodle VLE as a pdf. Should you wish to use them as a handout then you can print them out to annotate. The complete slide set will also be available after the lecture in a PowerPoint version for you to consult.

These two lectures will build on topics introduced by Dr Ferguson in his introduction to innate immunity lecture. Specifically it will focus on Pattern Recognition Receptors (PRRs). Examples of PRRs from the C-type lectin, Toll-like receptor (TLR) and NOD-like receptor (NLR) families will be discussed.

During the two lectures you will learn about:

- the broad mechanisms underlying receptor activation and signal transduction in PRRs

- the mechanisms by which TLRs and NLRs specifically recognize their ligands

- the formation of macromolecular signalling complexes such as the Myddosome and inflammasome by activated receptors

- the different approaches to the detection of lipopolysaccharide at the cell surface and in the cytoplasm

- the connection between PRRs and disease

The following reviews provide extensive coverage of the topics discussed. Relevant primary research will be referenced on the lecture slides.

1. Bryant CE, Orr S, Ferguson B, Symmons MF, Boyle JP, Monie TP. "International Union of Basic and Clinical Pharmacology. XCVI. Pattern recognition receptors in health and disease". Pharmacol Rev. 2015;**67**(2):462-504
2. Hardison, SE & Brown, GD. "C-type lectin receptors orchestrate antifungal immunity". Nat. Immunol. **13**, 817–822 (2012)
3. Bryant CE, Spring DR, Gangloff M, Gay NJ. (2010) "The molecular basis of the host response to lipopolysaccharide." Nat Rev Microbiol. **8**, 8-14
4. Lamkanfi, M., Dixit, V.M. "Mechanisms and functions of inflammasomes." Cell Volume **157**, 1013–1022 (2014)
5. Guo H, Callaway JB, Ting JP. "Inflammasomes: mechanism of action, role in disease and therapeutics. Nat Med 2015. Jul 21(7):677-87
6. Yang J, Zhao Y, Shao F. "Non-canonical activation of inflammatory caspases by cytosolic LPS in innate immunity". Curr Opin Immunol. 2015 Feb;32:78-83.
7. Gay NJ, Symmons MF, Gangloff M, Bryant CE. Assembly and localization of Toll-like receptor signalling complexes. Nat Rev Immunol. **14**, 546-58 (2014)
8. Song DH, Lee JO "Sensing of microbial molecular patterns by Toll-like receptors" Immunol Rev. 2012 Nov;250(1):216-29.
9. Jin MS, Lee JO. "Structures of the toll like receptor family and its ligand complexes". Immunity, 2008 Aug 15;29(2):182-91.